

Contribution to the umbellifers of Kashmir¹

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(With twelve text-figures)

Thirty-four species of Umbellifers belonging to the twenty-five genera are described. Keys to all the genera and species of a genus are given. Each species is described giving its diagnostic features. Localities of collection and distribution, local names and uses wherever known are also recorded. Twelve common Umbellifers in the region are illustrated.

INTRODUCTION

The family Umbelliferae is mainly distributed in Europe, North Africa, West, Central and North Asia, a few are North American, tropical and natives of Southern hemisphere. The members of the family thrive well in Kashmir as well as in other temperate zones of Western Himalayas.

The family is of great economic importance and all available members growing in Kashmir have been taken up for thorough chemical investigation by this laboratory. *Heracleum* spp. and *Ammi* spp. have given interesting results. This paper, describing the botanical aspects of the family, is the outcome of two years of field work carried out by me and is written with a view to helping those who are interested in the Umbellifers of Kashmir. It forms a further contribution to our knowledge of this family which has not received much attention from earlier workers on Kashmir flora, namely Blatter (1928), Coventry (1930) and Rao (1960, 1961).

All the specimens examined are deposited in Herbarium of this laboratory.

Abbreviations used in the text:

Blatt. Beau. Fls. Kash.	E. Blatter, BEAUTIFUL FLOWERS OF KASHMIR.
Coll. Fl. Siml.	H. Collett, FLORA SIMALENSIS.
DD	Herbarium of Forest Res. Instt., Dehra Dun.
FBI	J. D. Hooker, FLORA OF BRITISH INDIA.

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GENERIC KEY TO THE UMBELLIFERS OF KASHMIR

1. Leaves undivided, narrow lanceolate .. *Bupleurum*
1. Leaves divided
2. Leaves not pinnately divided
3. Leaves 3-partite, segment 1-2 fid .. *Apium*
3. Leaves 3-5 partite, segments spinuous .. *Eryngium*
2. Leaves pinnately divided
4. Fruit bristly, bristles curved or straight
5. Fruit upto 6.4 mm diam; bristles small .. *Torilis*
5. Fruit upto 1.5 cm diam; bristles rough and stout .. *Turgenia*
4. Fruit not bristly (rough corrugate, style bases depressed only in *Prangos*) .. *Prangos*
6. Leaf segments ovate to lanceolate
7. Nodes rooting, fruit not corky .. *Oenanthe*
7. Nodes generally free, fruit corky .. *Sium*
6. Leaf segments much divided
8. Fruit prolonged into a beak .. *Scandix*
8. Fruit never beaked .. *Vicatia*
9. Fruit ovoid or cylindrical not winged
10. Fruit cylindrical and scabrid .. *Anthriscus*
10. Fruit cylindrical but not scabrid .. *Chaerophyllum*
11. Fruit ovoid with loose outer coat .. *Pleurospermum*
11. Fruit ellipsoid, outer coat hard .. *Bunium*
12. Leaf segments filiform or obtuse
13. Fruit viscid .. *Carum*
13. Fruit with a deep narrow longitudinal groove and not viscid .. *Conium*
12. Leaf segments ovate or pinnatifid
14. Fruit ridges not distinct .. *Pimpinella*
14. Fruit ridges distinct, villous when young .. *Seseli*
9. Fruit flattened, lateral ridges winged
15. Petioles of leaflets winged .. *Ferula*
15. Petioles of leaflets not winged
16. Dorsal and intermediate ridges also winged, lateral wings narrow
17. Calyx-teeth none .. *Ligusticum*
17. Calyx-teeth lanceolate .. *Selinum*
16. Dorsal and intermediate ridges not winged, lateral wings broad
18. Lateral wings of 2 half fruits free
19. Petals entire, fruit 2 cm diam. .. *Angelica*
19. Petals subentire, fruit 1.5 cm diam. .. *Archangelica*
18. Lateral wings of 2 half fruits cohering until separation *Heracleum*

Bupleurum Linn.

Glabrous herbs, rarely shrubs. Leaves entire, obovate to linear lan-

ceolate, usually sessile. Flowers yellow, pedicelled or subsessile. Fruit slightly constricted at the commissure.

KEY TO THE SPECIES

1. Leaves amplexicaule, deeply cordate, nerves 10-20, palmate .. *jucundum*
1. Leaves sessile, sometimes semiamplexicaule nerves 5-9, convergent
 2. Leaves at least 1 cm broad, usually more
 3. Fruit upto 5 cm, ridges obscure, furrows with 3 vittae .. *lanceolatum*
 3. Fruit upto 1 cm distinctly ridged, furrows with 1-3 vittae .. *candollii*
 2. Leaves upto 1 cm broad, usually less
 4. Fruit upto 2 cm distinctly ridged, furrows with 1-6 vittae .. *falcatum*
 4. Fruit ovate, ridged and slight winged, furrows with 3 vittae .. *longicaule*

B. *jucundum* Kurz. in Journ. Bot. 5:240, 1867; FBI 2:675.

Stem erect, somewhat woody below. Leaves amplexicaule (mostly upper ones), nerves prominent, convergent. Bract 1, upto 6 mm, ovate often amplexicaule; bracteoles 3-5. Fruit 6 mm elliptic oblong with prominent ridges, furrows with 3-vittae.

Gurcharan 1500 (30.8.70) Dachigam Rakh.

I do not place it in var. *cachemirica* (of Hooker 1879) for its lower cauline leaves are not linear oblong or linear.

The var. *cachemirica* has been reported by Duthie, J.F. from Guraize valley and Liddar valley, Kashmir. The lower cauline leaves of these specimens are linear-oblong. Duthie 12602 (6-9-1892) Guraize, 7000-8000 ft (DD); Duthie 13305 (28-7-1893) Liddar valley, Kashmir (DD).

B. *lanceolatum* Wall. ex DC. Prodr. 4:131, 1830; FBI 2:674.

Perennial, erect, branched herbs. Leaves overlapping towards the base, narrowly lanceolate, nerves 5-7 prominent, running parallel, converging towards the apex. Bracts acute. Fruit 3-5 mm ridges not distinct.

Rattan Chand 7110 (2.9.60) Pahalgam; Kaul RRL 5543 (2.7.69) Shopian (Rajpora orchards).

Distribution: North West Himalayas.

B. *candollii* Wall. ex DC. Prodr. 4:131, 1830; FBI 2:674; Coll. Fl. Siml. 208, 1900; Blat. Beau. Fls. Kash. 1:143, 1928.

Perennial tufted herb. Leaves obovate, nerves 7-9 converging towards the apex. Bracts 2-4 ovate; bracteoles absent. Fruit upto 1 cm ridged.

Kapoor 2109 (15-9-51) Drang, near Ferozpur Nalla; Kaul 19629 (12.8.69). Tangmarg forest, Dachigam rakh (see fig. 10).

Distribution: Temperate Himalayas, Nepal.



Fig. 10. *Bupleurum candollei* Wall. Flowering branch. 10a. A fruit (dorsal view).

B. falcatum Linn. var. **marginata** (Wall. ex DC.) Clarke in Hook. f.; FBI 2:676, 1879.

Annual or biennial herbs. Leaves sessile, linear upto 9 cm long, nerves 5-7 prominent. Bracts upto 5 mm linear. Flowers yellow, stalks very short. Fruit obovate, ridged, ridges with distinct furrows.

Duthie 13061 (11-7-1893) Liddar Valley 5000-6000 ft (DD); Kapoor (13-7-46) Gurez Valley; Sobti 4749 (June, 56) Gularg; Kaul 2001 (July, 69) Dachigam.

Distribution: S. Europe, West and Central Asia, temperate Himalayas, E. Asia to Japan.

B. longicaule Wall. ex DC. Prodr. 4:131, 1830; Clarke in Hook. f. FBI 2:677, 1879; Blatt. Beau. Fls. Kash. 1:142, 1928.

Stem branching from the base. Lower cauline leaves linear lanceolate, nerves not prominent, upper leaves ovate with acute apex. Bracts 1-3, bracteoles 5 prominent longer than the umbellule. Fruit 1.5 cm elliptic or egg shaped.

Keshavanand 28655 (23-8-1908) Gulmarg forests (DD); Kapoor (14-7-46) Karagbal, Gurez; Kapoor 695 (15-8-46) Kangra to Kalpani; Sobti 4746 (1-7-56) Gulmarg; Kaul 1014 (July, 69) Uri.

Distribution: Subarctic Asia; W. Siberia, Central Asia, Tibet and Western Himalayas.

Apium Linn.

Annual or perennial herbs. Leaves pinnate or 3-partite, Umbels compound often leaf opposed. Fruit slightly longer than broad.

A. graveolens Linn. Sp. Pl. 264, 1753; Clarke in Hook. f. FBI 2:679, 1879; Polunin in Fls. Europe, 285, 1969.

Leaves 3-partite, segments once or twice trifid. Flowers white. Calyx-teeth insignificant. Fruit ridges narrow, vittae broad.

Kaul 308 (25-6-1970) Majid Bagh, Barzulla Vegetable fields.

Distribution: Kabul, West and Central Asia, Europe, N. Africa, Caucasus, Afghanistan, Pakistan.

Eryngium Linn.

Perennial herbs; leaves entire or lobed. Flowers in simple heads. Fruit ellipsoidal nearly cylindrical.

KEY TO THE SPECIES

- | | |
|--|----------------------------|
| Leaves divided, segments spinous | .. <i>billardieri</i> |
| Leaves undivided, segments not spinous | .. <i>biebersteinianum</i> |

E. billardieri Delaroche Eryng. 25, t. 2, 1808; FBI 2:670, Blatt. Beau. Fls. Kash. 1:141, 1928.

Stem upto 40 cm erect, branching from the base. Basal leaves long-stalked, segments 3-fid or pinnatifid, spinous-toothed. Bracts 5-7, no spines on margin bracteoles slightly spiny. Fruit upto 3 mm.

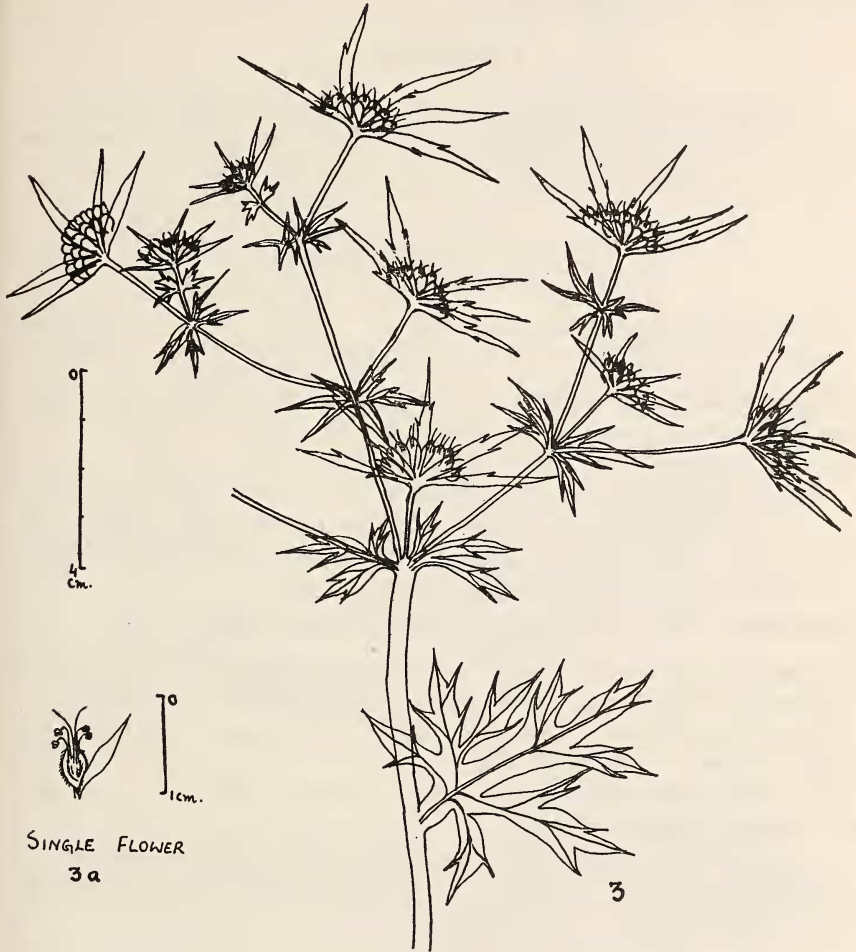


Fig. 3. *Eryngium billardieri* Delar. Flowering branch. 3a. A flower.

Dutt 7733 (27-8-62) Lal Mandi, Srinagar; Pando 8487 (July 62). University premises, Srinagar; Kaul 5595 (16-7-69) Barzulla fields, Srinagar (see fig. 3).

Distribution: Western Asia, Sind.

E. biebersteinianum Nevski ex Bobrov in Fl. USSR 16:86, 1950; Kitamura in Fl. Afghanistan, 285, 1960.

E. coeruleum Bieb. Fl. Taur. Cauc. 1:200, 1808; Clarke in FBI 2:669, 1879;

E. planum Lindl. in Royle Illust. Bot. Himal. 232, 1835 (non Linn.).

Stem upto 55 cm erect branched. Basal leaves stalked, undivided, crenate, not spiny. Bracts 5-6, slightly spiny; a few bracteoles sometimes spinous. Fruit upto 3 mm.

Gurcharan 1503 (20-7-70) Dachigam Rakh.

Distribution: Iran, Afghanistan.

Torilis Adans.

Annual herbs. Stem hispid or scabrid, generally rough. Leaves 2-4 pinnate. Bracts absent, bracteoles several. Fruit elliptic or oblong, constricted at commissure, bristly or with tubercles.

KEY TO THE SPECIES

1. Stem rough, scabrid. Fruit densely bristly .. *leptophylla*
1. Stem glabrous or appressedly hairy. Fruit hispid .. *japonica*

T. leptophylla (Linn.) Reichb. f. in Icones, Fl. Germ. 21, t. 2010, 1866; Stewart in Catalogue of Fl. of Pakistan 527, 1972.

Caucalis leptophylla Linn. Sp. Pl. 347, 1753; FBI 2:719.

Resembling *Torilis japonica* (Houtt) DC., but the leaves are finely cut, ultimate segments narrower. Peduncles carrying the umbels very short. Fruits almost sessile, covered with straight and hooked bristles.

Kaul 167 (22-5-70) Manasbal, weed in fields.

Distribution: West Asia, South Europe, North Africa.

T. japonica (Houtt) DC. Prodr. 4:219, 1830; Raizada in Ind. For. 92 (5):299-300, 1968; Kanai in Fl. Eastern Himalayas, 231, 1966.

Caucalis japonica Houtt., Nat. Hist. 26:42, 1777; *Caucalis anthriscus* sensu Clarke in Hook. f., FBI 2:718, 1879.

Bracts absent and bracteoles 3-4 narrow, filiform. Rays 5-7 in an umbel. Flowers purplish or white.

Thapliyal 25597 (24-5-58); Kaul RRL 5544 (9-7-69); (see fig. 9).

Distribution: Himalayas, Burma, Indo-China, China, Formosa, Korea, Japan and Sumatra.

Turgenia Hoffm.

Annual hispid herbs. Leaves with oblong pinnae, hairy on under-surface. Fruit upto 1.5 mm diam. covered all over with stout, rough, curved bristles.

T. latifolia (Linn.) Hoffm. Gen. Umbell. 59, 1814; Kitamura in Fl. Afghanistan, 291, 1960.

Caucalis latifolia Linn. Syst. Nat. ed. 12, 2:1205, 1768; FBI 2:719.



Fig. 9. *Torilis japonica* (Houtt) DC. Flowering branch. 9a. An umbel; 9b. A fruit.

Bracts absent, bracteoles linear. Rays 2-4 in each Umbel. Carpels with two lateral ridges in the form of commissures.

Kapoor 602 (15-7-46) Kashmir; Kaul 168 (22-5-70) Mansbal fields.
Distribution: Europe, N. Africa, Caucasus, Central Asia, Asia Minor, Iran, Afghanistan.

Prangos Lindl.

Perennial herbs, Leaves 3-4 pinnate. Umbels with many bracts and bracteoles. Flowers yellow. Fruit oblong, commissure broad.

Prangos pabularia Lindl. in Quart. J. Sci. 19:7, 1825; FBI 2:719; Rao in Bull. Bot. Surv. of India 2 (3 & 4): 403, 1960.

Leaves pinnate with long filiform segments. Bracts linear. Fruit roughly corrugate between ridges. Style bases depressed.



Fig. 12. *Prangos pabularia* Lindl. A leaf. 12a. An umbel with flowers. 12b. A fruit.

Duthie 13171 (24-7-1893) Liddar Valley; Kapoor 592 (13-7-46) Kamri village; Kapoor 1644 (15-6-47) Verinag top; Kapoor 2261 (28-6-52) Verinag top (see fig. 12). Local Name: Krungus. Roots are used locally to cure itch (Chopra 1956).

Distribution: Afghanistan, Pakistan.



Fig. 6. *Oenanthe javanica* (Bl.) DC. Flowering branch. 6a. fruit (dorsal view).

Oenanthe Linn.

Herbs with stoloniferous creeping roots, generally growing near wet places. Leaves 1-3 pinnate. Flowers white. Calyx-teeth small. Fruit ellipsoid, longer than broad.

Oenanthe javanica (Blume) DC. Prodr. 4:138, 1830; Maheshwari in Fl. Delhi, 178, t. 95, 1963.

Sium javanicum Blume Bijdr. Fl. Ned. 15:881, 1826.

O. stolonifera Wall. ex DC. Prodr. 4:138, 1830; FBI 2:696; Coll. Fl. Siml. 212, 1900.

Leaves 2-3 pinnate with oval pinnae. Fruit compressed ridged with all the ridges equal.

Kaul 85 (10-8-69), Chashma Shahi, Srinagar (see fig. 6).

Distribution: Java, China, Japan.

Sium Linn.

Leaves pinnate, pinnae toothed, Calyx teeth acute or obsolete. Flowers white. Fruit ovoid or oblong, laterally compressed, constricted at the commissure.

S. latijugum Clarke in Hook. f., FBI 2:683, 1879.

Leaves pinnate compound, pinnules long narrowly lanceolate. Fruit triangular, corky, furrows 2-3 vittae.

Local name: Jangali Gajar.

Gammie s.n. (10-7-1891) Srinagar, 5300 ft. (DD); Duthie s.n. (28-9-1893), Gurez (DD); Kapoor 2101 (Sept. 61) Yarikha, Gulmarg; Kaul 19668 (11-9-69) Chashma Shahi, Srinagar (see fig. 8).

Distribution: Kashmir and Baltistan.

Scandix Linn.

Annual herbs. Umbels simple or compound. Calyx teeth minute or 0, fruit oblong, beaked.

S. pecten-veneris Linn. Sp. Pl. 256, 1753; FBI 2:692; Polunin in Fls. Europe 279, 1969.

Leaves compound, ultimate segments small, narrow, Bracts 0, fruit with a long beak.

Kaul 5945 (2-7-69) Rajpora Shopian (see fig. 7); common in Srinagar fields.

Distribution: Pakistan and Afghanistan to western Europe, Central Asia.

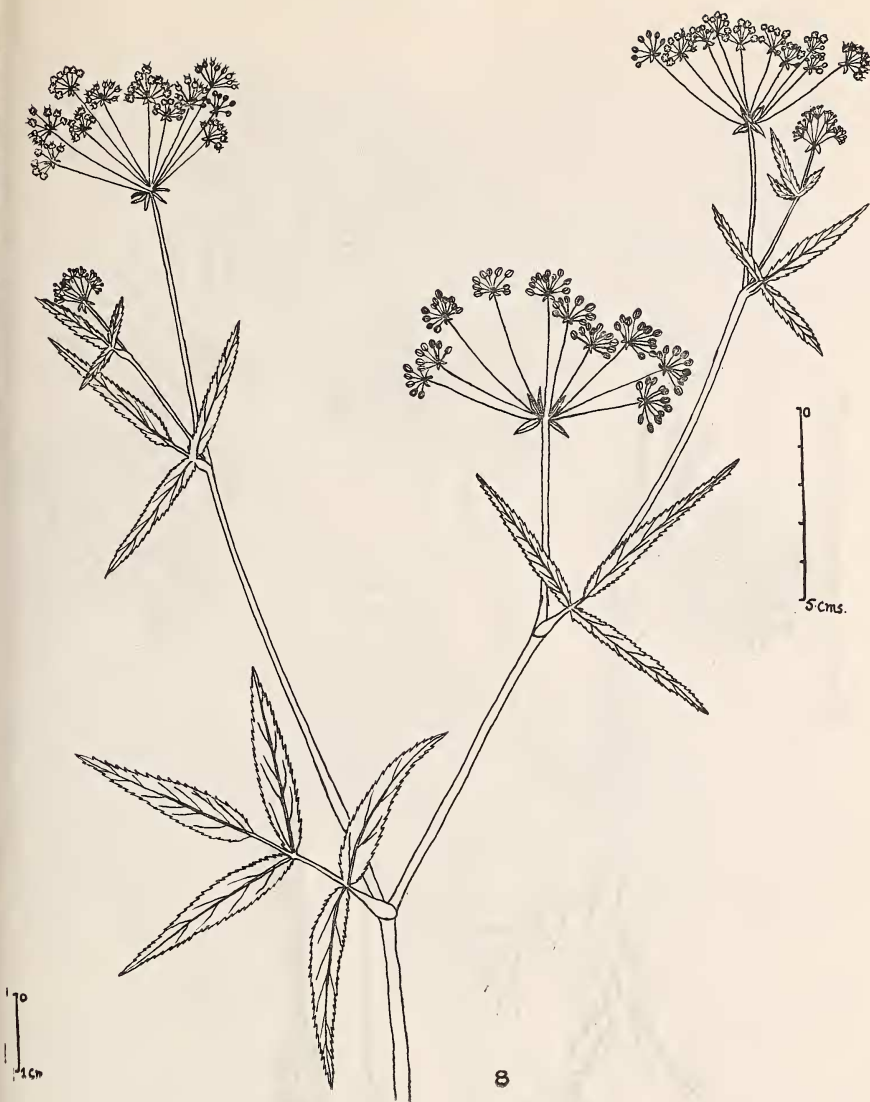


Fig. 8. *Sium latijugum* Clarke. A flowering branch.

Vicatia DC.

Perennial herbs. Leaves pinnately compound, ultimate segments narrow. Flowers white or pink or purple red. Fruit ovoid, narrowed at the apex, distinctly constricted at the commissure.

V. conifolia DC. Prodr. 4:243, 1830; FBI 2:670; Coll. Fl. Siml. 207, 1900; Rao in Rec. Bot. Surv. India 18(2):32, 1960; H. Hara in Fl. Eastern Himalayas, 232, 1966.

Bracteoles linear, flowers reddish when young. Fruit with distinct ridges, small not winged.

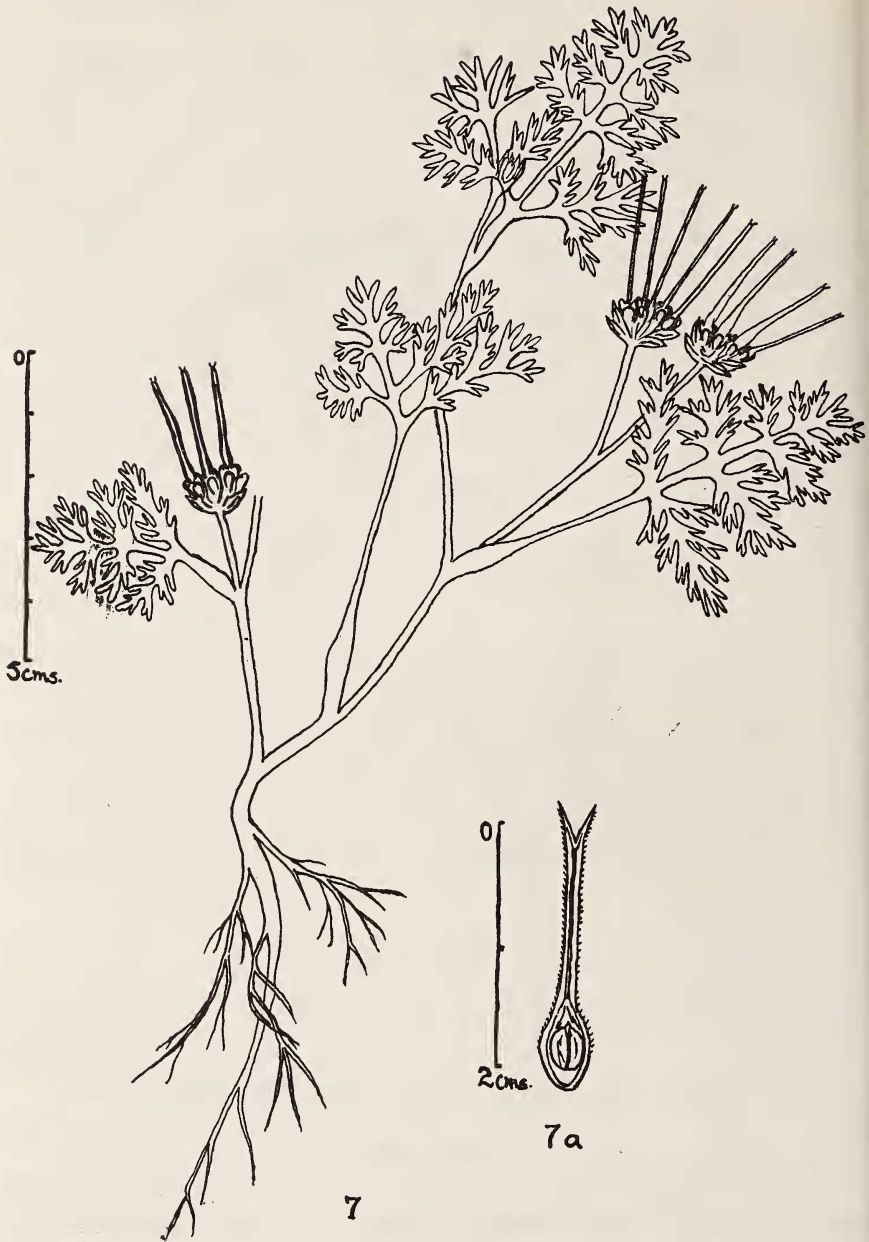


Fig. 7. *Scandix pecten-veneris* Linn. Flowering plant. 7a. fruit.

Kapoor 464 (27-6-46), Gulmarg 10,000 ft; Kapoor 659 (15-7-46), Kamri; Sarin 6629 (28-8-60) Gulmarg; Kaul 1011 (15-7-69) Rawalpura (see fig. 1).

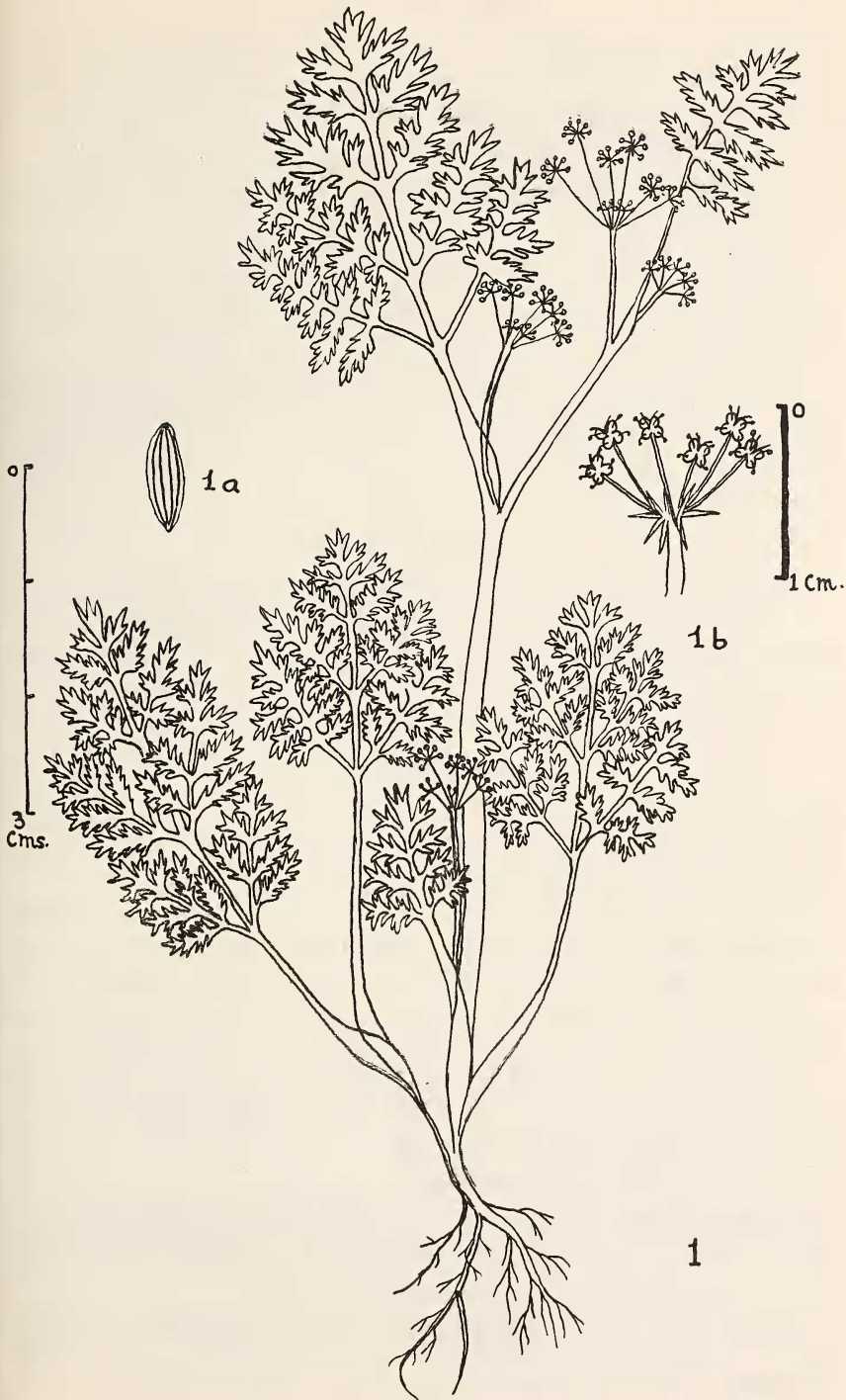


Fig. 1. *Victatia conifolia* DC. (Flowering plant). 1a. fruit (dorsal view).
1b. an umbel.

Anthriscus Pers.

Herbs with somewhat hairy stem. Leaves 2-3 pinnate, ultimate segments toothed. Flowers white in compound umbels. Fruit oblong, narrowed at the apex, constricted at commissure, vittae solitary in each furrow.

A. nemorosa (M. Bieb.) Spreng, Pl. Umb. Prodr. 27, 1813; FBI 2:692; Coll. Fl. Siml. 212, 1900.

Chaerophyllum nemorosum M. Bieb. Fl. Taur. Cauc. 1:232, 1808.

Leaflets broad, pinnatifid, slightly pubescent beneath. Bracts none, bracteoles several. Fruit upto 1.7 cm long, cylindrical, narrowed towards apex, scabrid, ridges obscure.

Duthie 11521 (26-6-1892) Sonamarg 8000-9000 ft (DD); Duthie 13482 (7-8-1893) Liderwat 9000-10,000 ft (DD); Keshavanand 28651 (22-5-1908) Khuihama forests, Lolab (DD).

Distribution: North Asia to East Europe.

Chaerophyllum Linn.

Annual or biennial, glabrous or hairy herbs. Leaves 2-pinnate with pinnatifid pinnules; bracts 0, bracteoles present. Fruit narrowed upwards, linear, glabrous. Leaves 2-3 pinnate, ultimate segments lanceolate and obtuse.

KEY TO THE SPECIES

Stem and leaves very hairy	.. <i>villosum</i>
Stem and leaves less hairy	.. <i>reflexum</i>
Leaves 1-2 pinnate, ultimate segments oblong, mucronate	.. <i>capnoides</i>

C. villosum Wall. ex DC. Prodr. 4:225, 1830; FBI 2:690-91; Coll. Fl. Siml. 211, 1900; Rao in Rec. Bot. Surv. India 18(2):32, 1960.

Bracts absent, bracteoles 3-6, linear white margined. Fruit 2-5 cm long, somewhat broader in the middle narrowed at both ends.

Duthie 11320 (1-6-1892) above Gulmarg (DD); Kapoor 1139 (26-7-52) Naseem Bagh; Kaul 417 (12-7-69) Dachigam Rakh; Kaul 81 (27-7-69) Chashma Shahi (see fig. 5).

Distribution: Temperate Himalayas.

C. reflexum Lindl. in Royle Illus. Bot. Himal. 232, 1835; FBI 2:691; Coll. Fl. Siml. 211, 1900; Rao in Bull. Bot. Surv. India 2 (3 & 4): 403, 1960; Kanai in Fl. Eastern Himalayas, 229, 1966.

Similar to *C. villosum* with the difference that leaves are longer much more dissected and less hairy. One to three fruits mature in each umbellule.

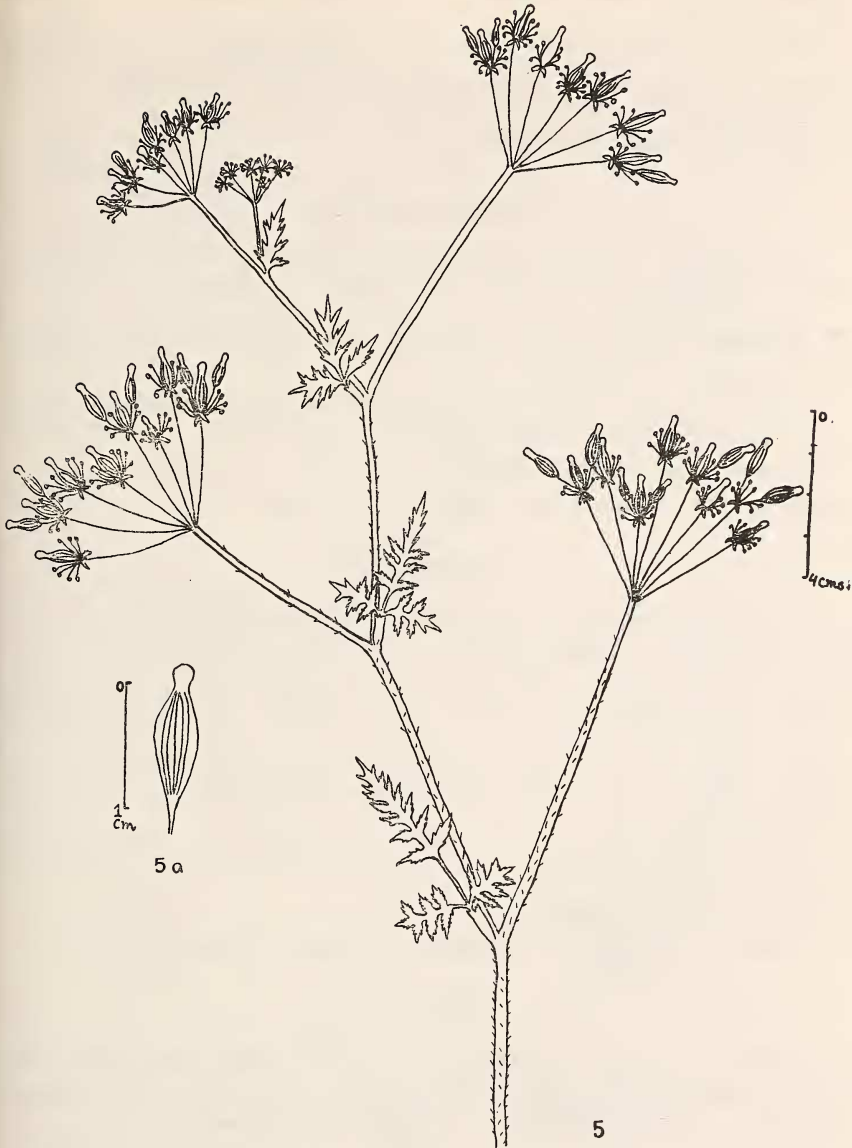


Fig. 5. *Chaerophyllum villosum* Wall. Flowering branch. 5a. fruit (lateral view).

Gammie s.n. (14-7-1891) Srinagar, 5300 ft (DD); Kapoor 431 (11-6-46) Naseem Bagh; Kaul 1015 (15-8-70) Dachigam Rakh.

Distribution: North West Himalayas; Pakistan; from Dalhousie to Kumaon; Afghanistan.

C. capnoides (Dcne.). Benth. in Gen. Pl. 1: 1867; Clarke in FBI 2:691, 1879.

Butinia capnoides Dcne. in Jacquem. V. Voy. dans l' Independent les annees, 70, t. 80, 1828.

Bracts 0, bracteoles 4-7, oblong lanceolate; rays 4-8. Fruit 6 mm minutely punctate, very much constricted at the commissure.

Gurcharan 1505 (25-4-70) Dachigam Rakh.

Distribution: North West Himalayas.

Pleurospermum Hoffm.

Perennial or biennial herbs. Leaves 1-4 pinnate; Umbels compound. Flowers white or dark purple. Fruit elliptic or oblong.

P. stellatum Benth. in Gen. Pl. 1:915, 1867; FBI 2:702; Blatt. Beau. Fls. Kashmir 1:140, 1928.

Leaves pinnate compound with small linear lobes; fruits with a loose outer coat, furrows 1-vittae, seed grooved.

Kapoor 134 (10-7-45) Bedori.

Distribution: Alpine North Western Himalayas.

Bunium Linn.

Annual herbs. Leaves 2-3 pinnate, ultimate segments filiform. Flowers white in compound umbels. Fruit oblong or ellipsoid.

B. persicum (Boiss.) B. Fedtsch in Rastit. Turkert. 612, 1915; Kitamura in Fl. Afgh. 283, 1960.

Carum persicum Boiss. in Ann. Sci. Nat. Ser. 3, 138, 1844. *Carum bulbocastanum* auct. non Koch. (1825): FBI, 2:681; Rao in Bull. Bot. Surv. India 2 (3 & 4): 402, 1960.

Bracts linear, sometimes divided; bracteoles absent. Fruit viscid, distinctly ridged, vittae one.

Local name: Janglizera.

Kaul 19736 (30-9-1971) Barzulla orchards (see fig. 4).

Carum Linn.

Annual or perennial herbs. Leaves much divided with linear segments. Flowers white. Calyx teeth small or none. Fruit ovoid, ellipsoid or oblong, laterally compressed, generally good smelling.

C. carvi Linn. Sp. Pl. 263, 1753; Rao in Rec. Bot. Surv. Ind. 18(2): 32, 1960.

Stem procumbent or erect. Leaves much divided, ultimate segments lanceolate. Bracts 1-3, Fruit 2 mm elliptic oblong, almost viscid.

Sarin 6581 (27-6-60) Gulmarg.

Distribution: West and North Asia, Europe.

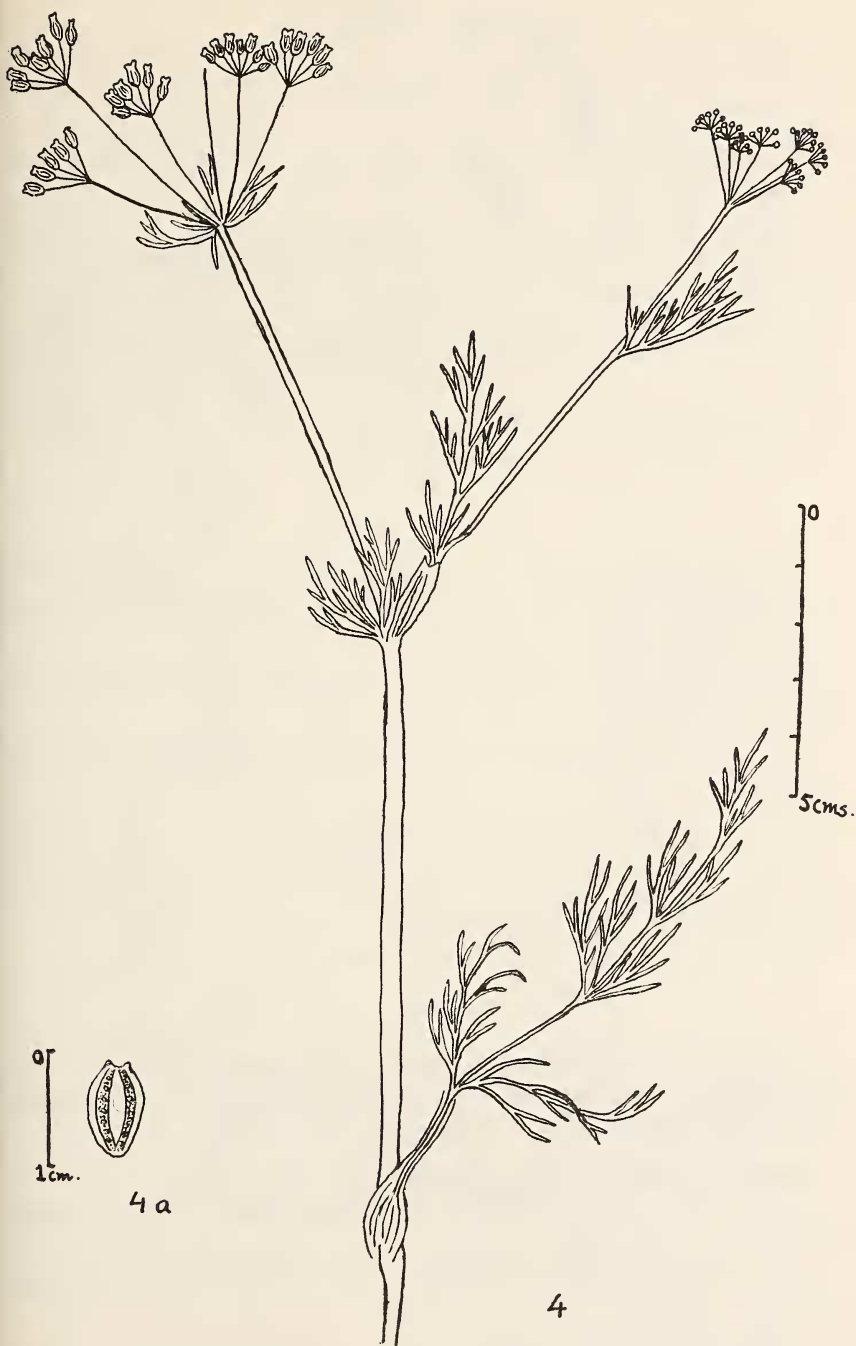


Fig. 4. *Bunium persicum* (Boiss) S. Fedtsch. 4a. fruit (dorsal view).

Conium Linn.

Fruit broadly ovoid to rounded with 5 prominent ribs; resin canals absent. Umbels compound, bracts and bracteoles few. Flowers white; Calyx absent.

C. maculatum Linn. Sp. Pl. 243, 1753; Rao in Bull. Bot. Surv. Ind. 2 (3 & 4): 304, 1960.

A smooth, purple spotted, hollow-stemmed, biennial, 1-2 metres tall plant. Leaves large, glabrous, 2-3 pinnate with segments blunt. Flowers white appearing in large showy umbels. Fruit prominently ridged and has on its inner surface a deep, narrow longitudinal groove.

Growing in waste places and other cultivated fields throughout Srinagar.

Gammie s.n. (13-7-1891), Srinagar 5300 (DD);

Kaul 5701 (12-7-70) Rainawari, Srinagar.

Pimpinella Linn.

Biennial or perennial herbs. Leaves 1-2 pinnate. Flowers in compound umbels. Calyx teeth 0, or small. Fruit laterally compressed, usually constricted at the commissure.

P. diversifolia Wall. ex DC. Prodr. 4:122, 1830; FBI 2:688; Coll. Fl. Siml. 210, 1900.

Leaves 1-pinnate; Bracts 0. Fruits narrow, hispidulous, ridges not prominent.

Hukum Singh 27154 (1-9-1907) Nagam (DD); Kapoor 176 (7-8-45) Gulmarg; Kapoor 1068 (26-6-47); Shankaracharya Hill; Kapoor 1177 (23-7-47) Banihal South Slope; Dutt 9096 (Sept. 62) Khillen Marg; Kaul 1012 (15-6-70) Harwan (see fig. 2).

Distribution: China, Afghanistan, Pakistan, Himalayas, Japan.

Seseli Linn.

Glabrous or pubescent herbs. Leaves 2-3 pinnate or twice 3-partite; flowers white. Calyx teeth minute or 0. Fruit oblong ovate or circular, not laterally compressed, broadest at the commissure.

S. sibiricum Benth. in Gen. Pl. 1:901, 1867; FBI 2:693.

Leaves 2-3 pinnate, fruits densely villous when young, dorsally compressed.

Kapoor 2275 (6-8-57) Khillennarg; Sarin 7124 (Sept. 62) Drang, Gulmarg.

Local Name: Bhoot Keshi.

Roots yield 1% essential oil which has hypotensive action and acts as a central nervous system sedative. (Chopra 1956).



Fig. 2. *Pimpinella diversifolia* DC. (Flowering branch).

Distribution: Afghanistan, Siberia and Europe.

Ferula Linn.

Perennial herbs with enormous roots smelling powerfully. Umbels compound. Flowers yellow. Fruit orbicular or ellipsoid, much compressed dorsally, lateral ridges winged.

F. jaeschkeana Vatke. Append. in Sem. Hort. Berol. 2, 1876; Clarke in FBI 2:708, 1879; Rao in Bull. Bot. Surv. Ind. 2 (3 & 4): 403, 1960.

Leaves compound, young leaves pubescent, petioles slightly winged; fruit purplish with 3 prominent ridges on each side of the commissure.

Keshavanand 27952 (14-6-1909) Lolab; Kapoor 2272 (15-8-52) Khillenmarg; Kaul 1021 (21-7-70) Drang (se efig. 11).

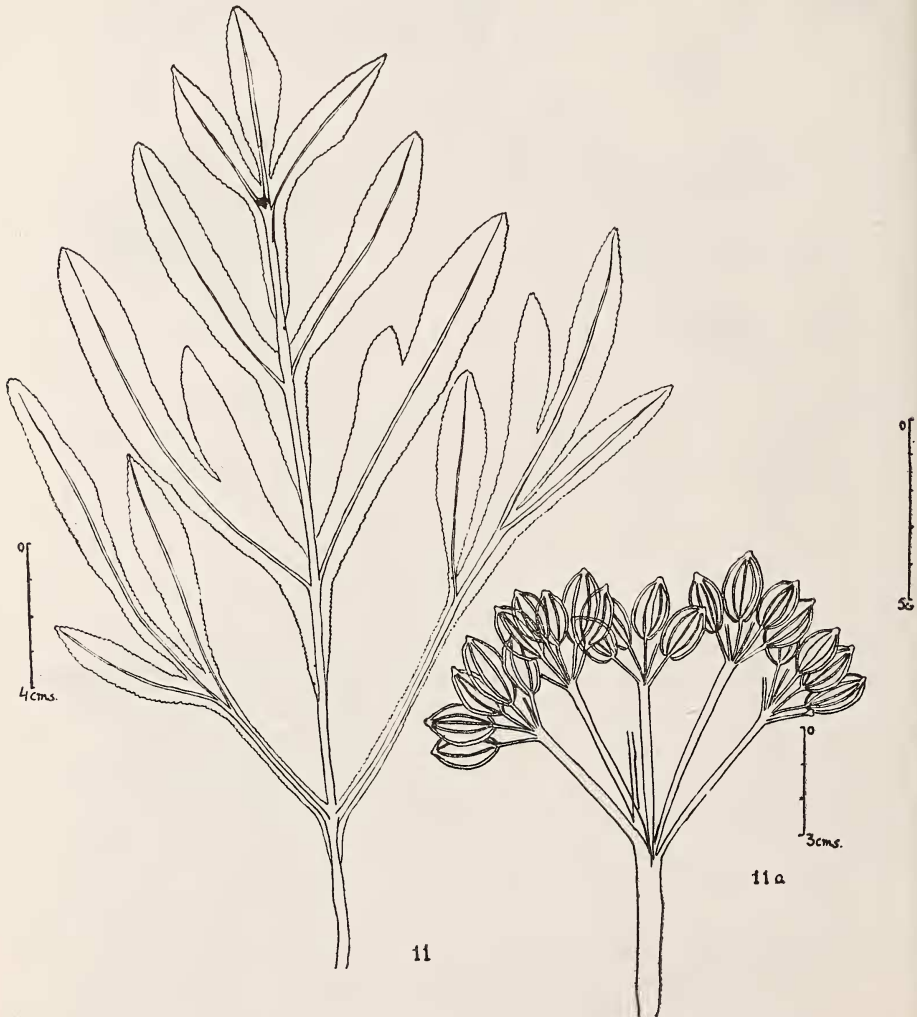


Fig. 11. *Ferula jaeschkeana* Vatke. A leaf. 11a. A fruiting umbel.

Distribution: Turkestan, Tianshan, Afghanistan.

Ligusticum Linn.

Perennial herbs. Leaves pinnate, pinnae minutely pubescent. Calyx teeth absent in flowers. Fruit ovoid ellipsoid, terete or dorsally compressed, furrows with at least 2 vittae.

L. thomsoni C.B. Clarke in Hook. f. FBI 2:698, 1879.

Leaves pinnate, pinnae oblong or ovate sometimes lobed, tough in texture, pedicels as well as leaves slightly pubescent. Flowers white. Fruit small with prominent ridges, dorsal furrows with 2-3 vittae.

Kaul 1009 (August '69) Tanmarg.

Distribution: Afghanistan.

Selinum Linn.

Perennial branched herbs. Leaves pinnate compound. Fruits ridged or not, seed plain on inner surface.

KEY TO THE SPECIES

Fruit with 3 prominent ridges	.. <i>tenuifolium</i>
Fruit with no prominent ridges, glabrous	.. <i>vaginatatum</i>

S. tenuifolium (Wall. ex DC.) Clarke in Hook. f. FBI 2:700, 1879; Coll. Fl. Siml. 213, 1900; Rao in Bull. Bot. Surv. Ind. 2 (3 & 4): 403, 1960.

Bracts linear, lobed. Bractcoles many. Flowers white in compound umbels. Fruit longer than broad, prominently ridged.

Kapoor 1237 (20-7-46) Tangmarg.

In Kashmir the roots are powdered and used as condiments.

Distribution: Temperate Himalayas.

S. vaginatatum C.B. Clarke in Hook. f., FBI 2:700, 1879; Coll. Fl. Siml. 213, 1900.

Leaves 1-2 pinnate, segments ovate lanceolate. Bracts linear as long as the umbellules. Flowers white in irregular compound umbels. Fruit 3 mm diam. ridges not prominent.

Bhadwar 3665 (12-8-35) Pahalgam; Bhadwar 5702 (16-8-44) Khillanmarg; Kapoor 892 (27-6-46) Pushwari, Kashmir; Kapoor 2275 (6-8-52) Drang; Kaul 1961 (8-8-69) Drang near Ferozpur Nalla.

In Kashmir the roots are used as condiments, which are often adulterated with the roots of *Seseli sibirica*. Both plants are known locally as *Bhoot Keshi* and can be easily distinguished on the basis of their habit.

Seseli sibirica grows in rock crevices and *Selinum vaginatatum* grows near moist situations.

Distribution: Kashmir to Kumaon.

Angelica Linn.

Perennial herbs. Leaves long 1-3 pinnate. Umbels compound with many rays. Calyx teeth 0, flowers white. Fruit ovoid, or ellipsoid, commissure broad, lateral ridges winged.

A. glauca Edgw. in Trans. Linn. Soc. 20:53, 1846; FBI 2:706; Coll. in Fl. Siml. 213; 1900; Rao in Rec. Bot. Surv. Ind. 18 (2): 33, 1960.

Leaves 3-pinnate, leaflets oblong. Fruits flattened, oblong, lateral ridges somewhat expanded at the top into a membranous structure.

Kapoor 876 (27-7-46) Pushwari; Kapoor (26-9-51) Gulmarg; Kapoor 2273 (5-8-52) Khilanmarg; Kaul 19631 (12-8-69) Gulmarg.

Local name: Choh'ore.

Roots locally used as a condiment after powdering. It is said to have a good cordial and stimulant value and is used in flatulence and dyspepsia.

Distribution: Western Himalayas.

Archangelica Hoffm.

Tall gigantic perennial herbs. Leaves 2-3 pinnate, pinnae large, toothed. Calyx teeth 0. Petals subentire, white. Fruit ellipsoid, subquadrate or oblong, commissure broad, lateral ones winged.

A. officinalis Hoffm. Pl. Umb. Gen. 1:162, 1814.

Angelica archangelica Linn. Sp. Pl. 250, 1753; Rao in Bull. Bot. Surv. Ind. 2 (3 & 4): 403, 1960.

Fruit oblong with three distinct middle ridges, lateral ones winged, smelling powerfully.

R. L. Bhadwar 3500 (27-7-35) Gulmarg; Kapoor 542 (10-7-46) Karghabal; Kapoor 1151 (27-7-47) Khillenmarg; Kaul 1020 (10-8-69) Gulmarg.

Distribution: N. Europe, Asia and America.

Heracleum Linn.

Perennial herbs. Leaves compound, hairy, umbels large with many rays. Flowers white. The lateral wings of the two halves of fruit cohering until separation.

KEY TO THE SPECIES

- | | |
|---|---------------------|
| Leaves and stem less hairy. Fruits winged | .. <i>thomsoni</i> |
| Leaves and stem pubescent or tomentose. | .. <i>candicans</i> |
| Fruits winged and ridged with a distinct median vittae. | |

H. thomsoni Clarke in Hook. f. FBI 2:711, 1879.

Bracts linear upto 2 cm bracteoles many. Umbels compound, 25-35 rays. Fruit 1 cm diam., prominently ridged, wings broad.

Kapoor 1186 (15-7-47) Banihal.

Distribution: North Himalayas.

H. candicans Wall. ex DC. Prodr. 4:135, 1830; FBI 2:714; Coll. in Fl. Siml. 215, 1900; Rao in Bull. Bot. Surv. Ind. 2 (3 & 4): 403, 1960.

Umbels compound, 30-40 rays. Fruit 1-3 cm diam. ridges prominent with distinct median vittae.

Kaul 5568 (9-6-69) Tangmarg forests; Kaul 19637 (12-8-69) Gulmarg.

Local name: 'Krandel'.

Roots and seed with strong smell. Milky juice comes out of roots on injury.

The roots of the plants are commercially exploited for the production of Xanthotoxin and as such the plant is economically of much importance.

Distribution: North Himalayas.

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